Fat (Crude) or Ether Extract in Meat

Scope

This method is suitable for the determination of the percentage fat in fresh meat and can also be used with canned dog foods.

Summary

The sample is placed on quartz sand in an extraction thimble and dried. The thimble is then extracted with ether in a manner similar to the direct ether extraction method.

Apparatus and Materials

A. Fat extraction thimble.

B. Quartz sand.

C. Beaker, 50 ml.

D. Fat extraction cup.

E. Desiccator.

F. Oven, 100-102^{o}C or 125^{o}C.

G. Fat extraction apparatus.

Reagents

A. Ethyl ether.

Procedure

A. Place approximately 25-30 g of quartz sand in an extraction thimble with a short stirring rod.

B. Add approximately 3-4 g of well ground sample (weigh to the nearest 0.0001 g by difference) to the thimble. Mix the sample thoroughly into the sand using the short stirring rod.

C. Place the thimble in a 50 ml beaker and dry for 6 hours at 100-102°C or 1.5 hours at 125°C.

D. Remove the thimble and sample from the oven and stir with the stirring rod to break up the chunks.

E. Dry the extraction cups for 30 minutes at 100°, cool in a desiccator and weigh to the nearest 0.0001 g.

F. Turn on the power switch on the service unit of the extraction system and allow it to warm up to proper temperature (100°) (20 - 30 minutes). Turn on the water to the extraction unit condenser.

G. Place the dried and weighed extraction cups in the cup holder.

H. Place the sample extraction mode knobs on the extraction unit in the "rinsing" position.

I. Insert the thimbles into the condensers by raising the holder into the condensers.

J. Move the extraction mode knob to the "boiling" position to pick up the thimbles and then move extraction mode knobs to "rinsing" position.

K. Remove the thimble support holder and center the thimbles if necessary.

L. Dispense 50 ml of dry ether into the sample cups and place the cups in a cup holder. Position the cups in holder on the hot plate.

M. Lower the handle on the left side of the unit ensuring that the safety catch engages.

N. Move the extraction mode knobs to the "boiling" position and extract samples in boiling ether for 30 mintues. Make sure the condenser valves are open.

O. Move the extraction mode knobs to the "rinsing" position and allow to rinse for 1 hour.

P. After extraction (and rinsing), close the condenser valves by turning a quarter turn.

Q. When almost all of the solvent is collected in the condenser, press the AIR button on the service unit and open the EVAPORATION valve on the extraction unit.

R. After the last traces of solvent are collected in the condenser, close the EVAPORATION valve.

S. Release the extraction cups by raising the handle and remove the cups with the cup holder.

T. Place the thimble support holder in position on the hot plate and lower the handle.

U. Move the extraction mode knobs to let the thimbles slide into the thimble supports.

V. Release the handle and follow the upward movement with the support holder. Bend the holder and remove the thimbles.

W. If another extraction is to be performed immediately, insert a new batch of thimbles and cups.

X. Fill the solvent reservoirs on condensers to the top mark with dry ether using a syringe through the holes on top of the unit.

Y. Open the condenser valves before beginning the next extraction.

Z. Dry the cups and fat at 100^{o} for about 30 minutes, cool in a desiccator and weigh to the nearest 0.0001 g.

Calculations

A. Subtract the weight of the cup from the weight of the cup plus fat to get the weight of the fat.

B. Divide the weight of the fat by the sample weight and multiply by 100 to get the percent of fat or ether extract.

Bibliography

Official Methods of Analysis (1984) 14th Ed., AOAC, Washington, D.C., sec. 24.005